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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,107	02/13/2004	Yoshiaki Eguchi	NIT-411	4558

24956 7590 03/07/2007
MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
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ALEXANDRIA, VA 22314

EXAMINER

GUYTON, PHILIP A

ART UNIT	PAPER NUMBER
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2113

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/777,107

Applicant(s)

EGUCHI ET AL.

Examiner

Philip Guyton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-20 is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☒ Claim(s) 4-6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,671,705 to Duprey et al. (hereinafter Duprey).

With respect to claim 1, Duprey discloses a data restoring method for restoring data stored in a second storage system in a storage subsystem (figure 1, item 120) including a first storage system (figure 1, item 130) and a second storage system (figure 1, item 140), each of which is connected to a host (figure 1, item 110) via a communication channel, in which the second storage system stores a copy of data to be transmitted from the first storage system, wherein

the first storage system processes an I/O request from the host, and as a result of I/O processing of the second storage system, transmits updated data (column 4, lines 27-36 and lines 58-61 and column 14, lines 45-58),

the second storage system retains data received from the first storage system as update log data (column 15, line 49-column 16, line 2), and

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the host transmits a command for settling a state of an application to the first storage system as data (figure 6, item 604), the first storage system transmits the data to the second storage system (figure 6, item 610 and column 16, lines 16-17), and the host and the second storage system both retain an identifier corresponding to the command (column 16, lines 6-13), and relate the identifier to the log data whereby the host designates the identifier at any given time to thereby restore data at any given time by the second storage system (column 19, line 58-column 20, line 5).

With respect to claim 2, Duprey discloses wherein the host issues an I/O instruction of an identifier to the second storage system at a remote site (column 1, lines 44-49 and column 10, line 53-column 11, line 15).

With respect to claim 3, Duprey discloses wherein the second storage system at a remote site receives the I/O instruction of an identifier of the host, and relates the update log of data to the identifier to store it in a storage unit (column 10, line 53-column 11, line 15 and column 19, line 58-column 20, line 5).

Allowable Subject Matter

3. Claims 7-20 are allowed.
4. The following is a statement of reasons for the indication of allowable subject matter:

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The elements of independent claims 7, 12, 18, and 20 were not found through a search of the prior art, nor were they considered obvious by the examiner. In particular, the prior art of record does not teach or suggest:

As in claim 7, "saving, when content of the storage unit has been updated, data prior to and subsequent to the update and information indicating a place to update as log data."

As in claims 12, 18, and 20, "a plurality of logical storage units, of which a certain logical storage unit stores a copy of data to be stored in a logical storage unit of the first storage system constituting a pair, and another logical storage unit comprises: a storage unit to be allocated in order to store log data generated by the first storage system; a cache memory for temporarily storing data to be inputted into or outputted from the storage unit; a memory for storing at least management information concerning the logical storage unit, management information for defining a configuration of pair duplex between the first storage system and the second storage system, management information of a log and a program for processing a command from the host; and a processor for executing the program."

5. Claims 4-6, 10, and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments filed 23 January 2007 have been fully considered but they are not persuasive. Applicant argues that Duprey does not disclose a first storage system that processes an I/O request from a host and, as a result of I/O processing at the second storage system, transmits updated data retained by the second storage system as update log data, as recited in claim 1. The examiner respectfully disagrees. Applicant states that in Duprey, "only during the ACTIVE state is the host permitted to read from or write to the master image." However, this has nothing to do with the disclosed mirroring functions in Duprey, nor a first storage system that processes an I/O request from a host and, as a result of I/O processing at the second storage system, transmits updated data retained by the second storage system as update log data. In fact Duprey teaches:

"The master storage unit performs a block-by-block copy of the master image to the slave image. This can be done while the mirror is in the ACTIVE state (404) or in the INACTIVE state (402). Any incoming write requests that are received by the master storage unit during resynchronization of the slave image are forwarded to the slave storage unit if and only if the write request is directed to a portion of the image that has already been written to in the slave."
(column 14, lines 47-54)

Thus, Duprey clearly teaches a first storage system that processes an I/O request from a host and, as a result of I/O processing at the second storage system, transmits updated data retained by the second storage system as update log data, as recited in claim 1.

Applicant additionally attempts to argue that the slave storage units 140 are not connected to a host via a communication channel as required by claim 1. However, the examiner respectfully disagrees. As seen in figure 1, each slave 140 is connected to master 130, which in turn is connected to host 110. Therefore, each slave 140 is connected to a host via a communication channel.

Regarding claim 2, applicant submits that Duprey does not disclose wherein an I/O instruction of an identifier from a host to a slave storage system is issued. However, Duprey teaches wherein each slave storage unit includes a Storage Processor (column 6, lines 8-12). A Storage Processor includes remote mirroring logic (column 6, lines 62-67). The remote mirroring logic maintains the write intent log (column 7, lines 13-15). Included in the write intent log is meta-data from the host, which includes a block identifier (column 16, lines 8-13). Thus, Duprey discloses wherein an I/O instruction of an identifier from a host to a slave storage system is issued as recited in claim 2.

In reference to claim 3, applicant argues Duprey does not disclose the slave storage systems receive an I/O instruction of an identifier of the host, and relate the update log of data to the identifier to store it in a storage unit. However, as discussed above in relation to claim 2, Duprey discloses the slave storage system receiving an I/O instruction of an identifier from the host. Since the identifier identifies the image block being updated (column 16, lines 8-13), Duprey effectively teaches relating the update log of data to the identifier to store it in a storage unit.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip Guyton whose telephone number is (571) 272-3807. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Beausoliel can be reached on (571) 272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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2/26/07


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